



**COUNTY OF LOS ANGELES DEPARTMENT OF HEALTH SERVICES**  
**IMMUNIZATION PROGRAM**  
**KINDERGARTEN RETROSPECTIVE SURVEY, 2009**  
**JUNE 2010**

## Background

The Kindergarten Retrospective Survey (KRS) is an annual survey conducted by the State of California that provides state and regional estimates of vaccination coverage among kindergarten enrollees at significant age milestones and by race/ethnicity.

## Methods

Approximately 3% (n=256) of all California kindergarten schools were randomly selected. Every sixth immunization record was selected at each sampled school. Collected data included kindergarten enrollee's date of birth, vaccination dates, and race/ethnicity.

## Key Results

The 2009 Kindergarten Retrospective Survey results are grouped into three categories:

- I. Study Population
- II. Series Coverage Results by Race/Ethnicity and Region
- III. Coverage by Age Milestone and Race/Ethnicity

Note #1: Not all results or differences that are presented are statistically significant.

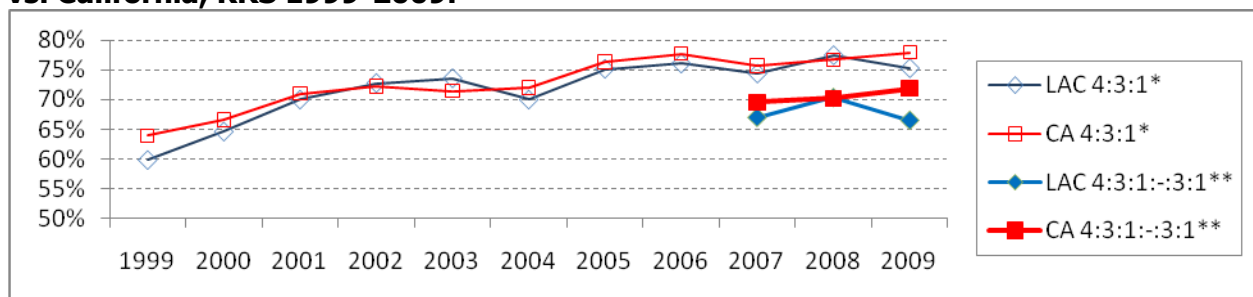
Note #2: Hib immunization is not required for kindergarten enrollment. In addition, due to the Hib shortage which began in December 2007, computation of childhood immunization series measures without Hib is being done temporarily.

### I. Study Population

- The 2009 Los Angeles County (LAC) sample represented 28.3% (n=752) of the state's total sample of 2,659 children.
  - LAC representation in the state's total sample in 2009 (28.3%) was slightly below the previous 5-year average of 30.0% (n=754).
- The children sampled in 2009 were born between 2002 and 2004; thus this report presents the vaccination coverage assessment of children who were 4-6 years of age in 2009 or 24 months of age in 2005-2006.

### II. Series Coverage Results by Race/Ethnicity and Region

**Figure 1. Estimated vaccination coverage at 24 months of age, Los Angeles County vs. California, KRS 1999-2009.**



\* ≥ 4 doses of DTaP/DT, ≥ 3 doses of polio, ≥ 1 dose(s) of MMR vaccines.

\*\* ≥ 4 doses of DTaP/DT, ≥ 3 doses of polio, ≥ 1 dose(s) of MMR, ≥ 3 doses of Hep B, and ≥ 1 dose(s) of varicella vaccines. Hib is not required for kindergarten enrollment.

Note: DTaP/DT represents doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any pertussis vaccine (DTP/DTaP/DT). DTaP is the vaccine of choice for children 6 weeks through 6 years of age. Pediatric DT is recommended for children with valid contraindications to pertussis vaccine. DTP has not been used in the U.S. since 2002.

- In 2009, Los Angeles County coverage level for the 4:3:1:-:3:1 series at 24 months of age (66.5%) was 7.5% lower than the State (71.9%).
- LAC 4:3:1 series coverage levels have paralleled each other since 1999, although California levels are commonly higher than LAC levels. Between 2008 and 2009, LAC 4:3:1 coverage (75.3%) was within 3.3% of the State level (77.9%).

**Table 1. Vaccination coverage estimates for the 4:3:1--:3:1 series<sup>1</sup> at 24 months of age by race/ethnicity<sup>2</sup> and region<sup>3</sup>, KRS 2009.**

	California <sup>4</sup> (N=2,659)	LAC <sup>5</sup> (N=752)	Other SoCal <sup>6</sup> (N=673)	SF Bay Area <sup>7</sup> (N=533)	Central Coast <sup>8</sup> (N=123)	Central Valley <sup>9</sup> (N=202)	North Central Valley <sup>10</sup> (N=244)	Rural NorCal <sup>11</sup> (N=132)
Overall	71.9 ± 2.1 <sup>12</sup>	66.5 ± 5.0	76.0 ± 3.5	73.8 ± 4.4	73.8 ± 4.6	71.8 ± 4.1	69.6 ± 7.8	70.0 ± 7.9
African- American (n=320)	60.2 ± 7.5	65.0 ± 13.4	64.2	58.8	— <sup>13</sup>	— <sup>13</sup>	55.5	— <sup>13</sup>
Asian (n=181)	71.9 ± 8.1	52.8 ± 24.8	82.2	72.2	— <sup>13</sup>	— <sup>13</sup>	62.5	— <sup>13</sup>
Hispanic (n=1,229)	71.2 ± 2.7	67.1 ± 5.1	77.9	70.0	74.3	75.6	64.6	67.4
White (n=705)	72.5 ± 3.9	64.5 ± 12.1	74.3	59.5	69.4	65.5	76.6	71.2
Other (n=100)	78.5 ± 8.6	— <sup>13</sup>	— <sup>13</sup>	— <sup>13</sup>	— <sup>13</sup>	— <sup>13</sup>	— <sup>13</sup>	— <sup>13</sup>
Unknown (n=124)	84.5 ± 8.3	— <sup>13</sup>	— <sup>13</sup>	— <sup>13</sup>	— <sup>13</sup>	— <sup>13</sup>	— <sup>13</sup>	— <sup>13</sup>

<sup>1</sup> ≥ 4 doses of DTaP/DT, ≥ 3 doses of polio, ≥ 1 dose(s) of MMR, ≥ 3 doses of Hep B, and ≥ 1 dose(s) of varicella vaccines. Hib is not required for kindergarten enrollment.

<sup>2</sup> As recorded on student immunization record (blue card). Individual racial groups do not include Hispanic children. Children of Hispanic ethnicity may be of any race.

<sup>3</sup> Regions do not exactly match Field Rep assigned regions.

<sup>4</sup> California includes all regions.

<sup>5</sup> Los Angeles includes Los Angeles County.

<sup>6</sup> Other So. California includes Imperial, Orange, Riverside, San Bernardino, and San Diego Counties.

<sup>7</sup> SF Bay Area includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties.

<sup>8</sup> Central Coast includes Monterey, San Luis Obispo, Santa Barbara, Santa Cruz, and Ventura Counties.

<sup>9</sup> Central Valley includes Fresno, Kern, Kings, Madera, Merced, and Tulare Counties.

<sup>10</sup> No. Central Valley includes Sacramento, San Joaquin, and Stanislaus Counties.

<sup>11</sup> Rural No. California includes Alpine, Amador, Butte, Calaveras, Colusa, Del Norte, El Dorado, Glenn, Humboldt, Inyo, Lake, Lassen, Mariposa, Mendocino, Modoc, Mono, Nevada, Placer, Plumas, San Benito, Shasta, Sierra, Siskiyou, Sutter, Tehama, Trinity, Tuolumne, Yolo, and Yuba Counties.

<sup>12</sup> Estimates presented as point estimate (%) ± 95% confidence interval.

<sup>13</sup> Inadequate sample size to calculate coverage estimates.

Note: DTaP/DT represents doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any pertussis vaccine (DTP/DTaP/DT). DTaP is the vaccine of choice for children 6 weeks through 6 years of age. Pediatric DT is recommended for children with valid contraindications to pertussis vaccine. DTP has not been used in the U.S. since 2002.

- When ranked against the six other state regions, LAC ranked seventh for 4:3:1--:3:1 series at 66.5% (95% CI: 61.5% - 71.5%) in 2009.
- LAC Asian kindergarten enrollees had the lowest 4:3:1--:3:1 coverage level (52.8%) relative to other ethnic groups within LAC, and the lowest coverage level for Asians compared to the other sampled regions in the State.
- Among African Americans, LAC had the highest 4:3:1--:3:1 coverage level (65.0%) compared to the other regions in the State.
- LAC Hispanic kindergarten enrollees had the highest 4:3:1--:3:1 coverage level (67.1%), relative to other ethnic groups within LAC. However, LAC had the second lowest 4:3:1--:3:1 coverage level among Hispanics when ranked against the other California regions.
- Among Whites, LAC had the second lowest 4:3:1--:3:1 coverage level (64.5%) above the San Francisco Bay Area (59.5%).

**Table 2. Vaccination coverage estimates at 24 months of age by region and antigen, KRS 2009.**

	California <sup>1</sup> (N=2,659)	LAC (N=752)	Other SoCal <sup>2</sup> (N=673)	SF Bay Area <sup>3</sup> (N=533)	Central Coast <sup>4</sup> (N=123)	Central Valley <sup>5</sup> (N=202)	North Central Valley <sup>6</sup> (N=244)	Rural NorCal <sup>7</sup> (N=132)
4:3:1:-:3:1 series <sup>8</sup>	71.9 ± 2.1 <sup>9</sup>	66.5 ± 5.0	76.0 ± 3.5	73.8 ± 4.4	73.8 ± 4.6	71.8 ± 4.1	69.6 ± 7.8	70.0 ± 7.9
4:3:1:-:3 series <sup>10</sup>	75.1 ± 2.0	70.7 ± 4.5	78.6 ± 3.6	76.9 ± 4.3	76.4 ± 4.5	73.9 ± 4.9	71.2 ± 8.6	77.2 ± 9.9
DTaP/DT (4+)	80.8	78.6	82.5	83.3	81.6	78.1	77.7	82.6
Polio (3+)	92.8	92.2	93.3	92.7	92.9	94.4	91.7	92.6
MMR (1+)	92.3	91.4	93.3	90.7	93.2	95.1	89.0	95.9
Hep B (3+)	91.4	87.6	91.5	94.4	92.8	94.5	92.9	91.2
Varicella (1+)	87.2	84.8	89.9	87.0	86.3	86.7	87.4	86.4
Hib (1+)	— <sup>11</sup>	— <sup>11</sup>	— <sup>11</sup>	— <sup>11</sup>	— <sup>11</sup>	— <sup>11</sup>	— <sup>11</sup>	— <sup>11</sup>

<sup>1</sup> California includes all regions.

<sup>2</sup> Other So. California includes Imperial, Orange, Riverside, San Bernardino, and San Diego Counties.

<sup>3</sup> SF Bay Area includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties.

<sup>4</sup> Central Coast includes Monterey, San Luis Obispo, Santa Barbara, Santa Cruz, and Ventura Counties.

<sup>5</sup> Central Valley includes Fresno, Kern, Kings, Madera, Merced, and Tulare Counties.

<sup>6</sup> North Central Valley includes Sacramento, San Joaquin, and Stanislaus Counties.

<sup>7</sup> Rural No. California includes Alpine, Amador, Butte, Calaveras, Colusa, Del Norte, El Dorado, Glenn, Humboldt, Inyo, Lake, Lassen, Mariposa, Mendocino, Modoc, Mono, Nevada, Placer, Plumas, San Benito, Shasta, Sierra, Siskiyou, Sutter, Tehama, Trinity, Tuolumne, Yolo, and Yuba Counties.

<sup>8</sup> ≥ 4 doses of DTaP/DT, ≥ 3 doses of polio, ≥ 1 dose(s) of MMR, ≥ 3 doses of Hep B, and ≥ 1 dose(s) of varicella vaccines. Hib is not required for kindergarten enrollment.

<sup>9</sup> Estimates presented as point estimate (%) ± 95% confidence interval.

<sup>10</sup> ≥ 4 doses of DTaP/DT, ≥ 3 doses of polio, ≥ 1 dose(s) of MMR, ≥ 3 doses of Hep B vaccines. Hib is not required for kindergarten enrollment.

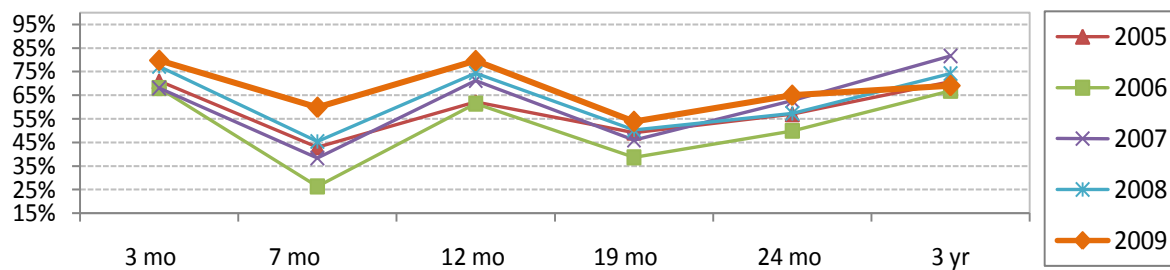
<sup>11</sup> Not estimated for Kindergarten students.

Note: DTaP/DT represents doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any pertussis vaccine (DTP/DTaP/DT). DTaP is the vaccine of choice for children 6 weeks through 6 years of age. Pediatric DT is recommended for children with valid contraindications to pertussis vaccine. DTP has not been used in the U.S. since 2002.

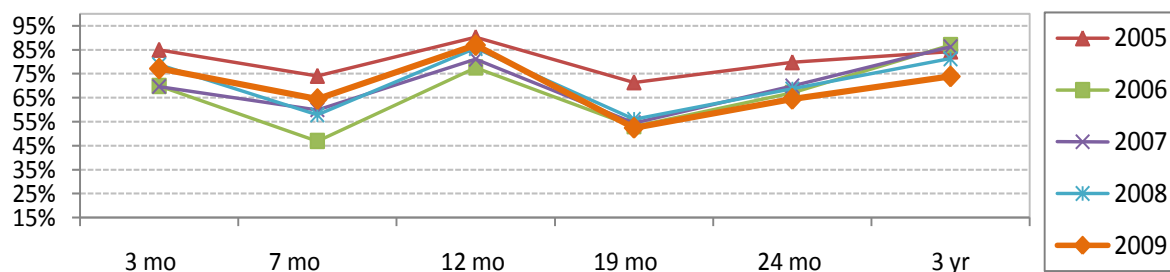
- When ranking the seven sampled regions by their antigen-specific coverage levels at 24 months of age, LAC kindergarten enrollees ranked fifth for DTaP/DT 4+ and MMR 1+, sixth for Polio 3+, and seventh for Varicella, Hep 3+, and the 4:3:1:-:3 and 4:3:1:-:3:1 series.

### III. Coverage by Age Milestone and Race/Ethnicity

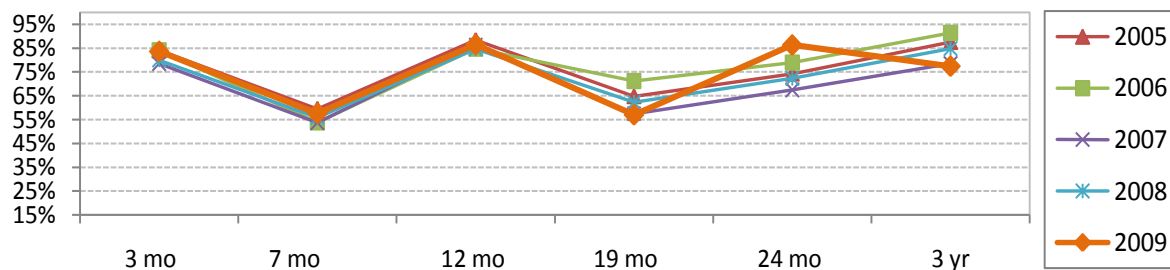
**Figure 2. Estimated vaccination coverage with recommended vaccines by age among African-Americans, Los Angeles County KRS 2005-2009.**



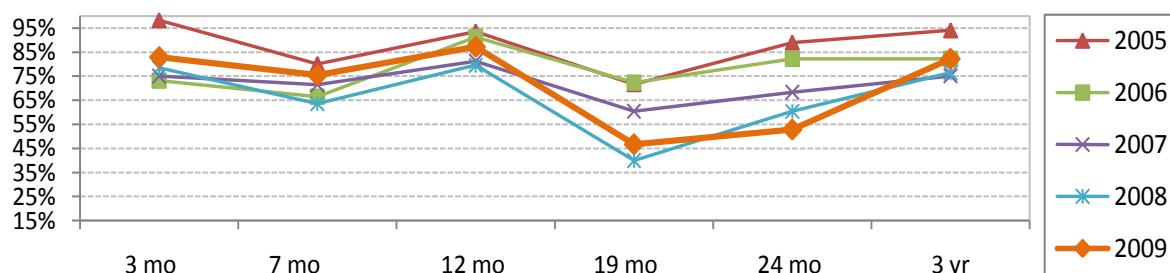
**Figure 3. Estimated vaccination coverage with recommended vaccines by age among Whites, Los Angeles County KRS 2005-2009.**



**Figure 4. Estimated vaccination coverage with recommended vaccines by age among Hispanics, Los Angeles County KRS 2005-2009.**



**Figure 5. Estimated vaccination coverage with recommended vaccines by age among Asians, Los Angeles County KRS 2005-2009.**



Note#1: Between 2004-2006, the recommended coverage by age milestone was: 3 months -  $\geq 1$  dose(s) of DTaP/DT and  $\geq 1$  dose(s) of Polio; 7 months -  $\geq 3$  doses of DTaP/DT and  $\geq 2$  doses of Polio; 12 months -  $\geq 3$  doses of DTaP/DT and  $\geq 2$  doses of Polio; 19 months, 24 months, and 3 years -  $\geq 4$  doses of DTaP/DT,  $\geq 3$  doses of polio, and  $\geq 1$  dose(s) of MMR vaccines. For 2007, the recommended coverage was: 3 months -  $\geq 1$  dose(s) of DTaP/DT,  $\geq 1$  dose(s) of Polio,  $\geq 1$  dose(s) of Hep B; 7 months -  $\geq 3$  doses of DTaP/DT,  $\geq 2$  doses of Polio,  $\geq 2$  doses of Hep B; 12 months -  $\geq 3$  doses of DTaP,  $\geq 2$  doses of Polio,  $\geq 2$  doses of Hep B; 19 months, 24 months, and 3 years -  $\geq 4$  doses of DTaP/DT,  $\geq 3$  doses of polio,  $\geq 1$  dose(s) of MMR,  $\geq 3$  doses of Hep B,  $\geq 1$  dose(s) of varicella vaccines. Hib is not required for kindergarten enrollment.

Note#2: DTaP/DT represents doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any pertussis vaccine (DTP/DTaP/DT). DTaP is the vaccine of choice for children 6 weeks through 6 years of age. Pediatric DT is recommended for children with valid contraindications to pertussis vaccine. DTP has not been used in the U.S. since 2002.

**Table 3. Vaccination coverage estimates at age milestones by race/ethnicity, California vs. Los Angeles County, KRS 2009.**

	3 mo		7 mo		12 mo		13 mo		19 mo		24 mo				3 yr			
	1DTaP/DT 1Polio 1HepB		3DTaP/DT 2Polio 2HepB		3DTaP/DT 2Polio 2HepB		3:2:1:-:2:1 series <sup>1</sup>		4:3:1:-:3:1 series <sup>2</sup>		4:3:1:-:3 series <sup>3</sup>		4:3:1:-:3:1 series <sup>2</sup>		4:3:1:-:3 series <sup>3</sup>		4:3:1:-:3:1 series <sup>2</sup>	
	LAC	CA	LAC	CA	LAC	CA	LAC	CA	LAC	CA	LAC	CA	LAC	CA	LAC	CA	LAC	CA
Overall	82.1 ± 3.7 <sup>4</sup>	83.6 ± 1.8	60.2 ± 4.4	62.7 ± 2.5	85.7 ± 3.0	82.5 ± 1.6	47.3 ± 5.7	44.5 ± 2.6	55.8 ± 5.3	60.8 ± 2.2	70.7 ± 4.5	75.1 ± 2.0	66.5 ± 5.0	71.9 ± 2.1	81.1 ± 3.8	79.8 ± 1.8	75.7 ± 4.7	75.6 ± 2.0
African-American	79.8	78.6	59.9	51.5	79.7	70.1	49.2	37.5	53.9	46.7	65.9	62.7	65.0	60.2	70.0	70.9	69.1	67.9
Asian	82.9	84.8	75.4	74.2	87.2	87.7	41.5	42.8	46.7	60.2	58.2	76.8	52.8	71.9	82.5	85.6	71.8	82.2
Hispanic	83.6	84.7	57.6	60.4	86.5	86.3	48.2	47.0	57.0	61.3	71.3	74.2	67.1	71.2	82.6	82.4	76.5	77.4
White	77.2	81.9	64.4	64.6	87.0	79.1	39.0	42.1	52.4	60.4	70.0	76.0	64.5	72.5	78.6	76.0	73.9	72.3
Other	89.7	84.4	69.7	64.1	78.9	76.5	66.2	42.6	56.9	66.2	78.0	80.9	73.3	78.5	83.6	75.8	83.6	74.7
Unknown	72.1	85.3	64.1	70.4	71.4	76.6	70.7	47.3	64.1	71.7	77.3	88.0	77.3	84.5	78.6	82.2	78.6	78.5

<sup>1</sup> ≥ 3 doses of DTaP/DT, ≥ 2 doses of polio, ≥ 1 dose(s) of MMR, ≥ 2 doses of Hep B, and ≥ 1 dose(s) of varicella vaccines. Hib is not required for kindergarten enrollment.

<sup>2</sup> ≥ 4 doses of DTaP/DT, ≥ 3 doses of polio, ≥ 1 dose(s) of MMR, ≥ 3 doses of Hep B, and ≥ 1 dose(s) of varicella vaccines. Hib is not required for kindergarten enrollment.

<sup>3</sup> ≥ 4 doses of DTaP/DT, ≥ 3 doses of polio, ≥ 1 dose(s) of MMR, ≥ 3 doses of Hep B vaccines. Hib is not required for kindergarten enrollment.

<sup>4</sup> Estimates presented as point estimate (%) ± 95% confidence interval.

Note: DTaP/DT represents doses of any diphtheria and tetanus toxoids and pertussis vaccines including diphtheria and tetanus toxoids, and any pertussis vaccine (DTP/DTaP/DT). DTaP is the vaccine of choice for children 6 weeks through 6 years of age. Pediatric DT is recommended for children with valid contraindications to pertussis vaccine. DTP has not been used in the U.S. since 2002.

- All race/ethnicity group coverage estimates peaked at the 3-month, 12-month, and 3-year age milestones.
  - Asians, Hispanics, and Whites all reached their highest recommended coverage level at the 12-month age milestone. African-Americans reached their highest coverage level at the 3-month age milestone, closely followed by the 12-month age milestone.
- Hispanics had the highest recommended coverage levels for most age milestones. The exceptions were coverage at the 7-month, 12-month, and 13-month age milestones in which Asians or African-Americans had the highest coverage levels.
- Overall, LAC coverage estimates were similar to the State's coverage estimates for each age milestone.
  - LAC was within 8% of California's coverage levels.
- LAC had adequate coverage levels by race and ethnicity, compared to the State's levels.
  - Among Whites, LAC estimates were slightly higher at the 12-month and 36-month age milestones.
  - Coverage levels among Hispanics in LAC were within 7% of California's coverage estimates for Hispanics.
  - African Americans in LAC had higher coverage estimates than California for all coverage estimates except for the coverage level of the 4:3:1:-:3 series at the 36-month age milestone.
  - Asians in LAC had higher coverage estimates for the 7-month age milestone only.